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ABSTRACT

The relationship between education and the United States (U.S.) economy was explored to identify research needed to inform employment policy in the future. Special attention was paid to the following topics: the state of education in the U.S.; key problems in grades K-12 that must be addressed; student achievement; inequity; costs of special education; and proposed "silver bullet" answers to existing problems. On the basis of the evidence reviewed, it was concluded that mediocre educational results do not threaten economic performance and that major initiatives toward reforming education have had limited success. It was further concluded that research and policy analyses in the economics of education can play an important role in directing educational policymakers toward improved student achievement through better curriculum, instruction, leadership development, and professional development. The following were among the areas of inquiry suggested: (1) using econometric techniques to identify the impacts of programs and initiatives; (2) identifying those interventions that work best with disadvantaged students; (3) assessing the cost-effectiveness of educational initiatives; (4) determining the best ways of using incentives to improve the system; and (5) determining whether financing affects student achievement and identifying ways of improving the equity and efficiency of financing public education. (Contains 15 references.) (MN)

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Kevin M. Hollenbeck

Education and the Economy

[Editor's note: This is the seventh in a series on Research Questions for the New Millennium. The series aims to identify research needed to inform employment policy in the future.]

Almost two decades ago, education was under attack. The report *A Nation at Risk* (National Commission on Excellence in Education 1983, p. 5) made the statement, "If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war." At the time, the United States had experienced a deep recession and the country worried about significant international competition. This past year, education was again under attack. In campaigning for the presidency, Governor George W. Bush suggested that there is a significant "educational recession" in this country (Dao 2000). Yet, the United States is experiencing unprecedented economic growth that is the envy of all of the world's economies. Can education be blamed for the recession of the eighties? Should education receive credit for the booming economy of the nineties? Is there even a connection between economic performance and education?

The dire predictions of *A Nation at Risk* did not materialize and, if anything, were exactly wrong. Shortly after it was published, the United States entered a period of economic and productivity growth. Does this prove that there is no connection between education and economy? No. For one thing, the United States increased substantially its investment in education after the release of *A Nation at Risk*. Further, economic development studies and policies suggest that firms believe that the educational attainment of workers is one of the most important factors in siting their activities. International growth studies consistently use education in their models (see Bils and Klenow [2000] and references cited therein.) Finally, one of the most consistent empirical findings in labor economics is a substantial return to education in explaining wages and earnings. If you believe that there is a substantial nexus between the performance of the educational system and the economy, and if you believe that the U.S. educational system is underperforming, then a reasonable conclusion is that the U.S. economy could be even stronger.

However, even if you believe that the causal connection between education and the level of the macroeconomy is weak, the educational attainment of individuals may be important on equity grounds; that is, individuals' education may be key to their own economic situations. So

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education determines the distribution of income, not just its growth.

The State of Education

What is the state of education in the United States? One problem that we have in trying to answer this broad question is that the nation has never achieved a consensus on the purpose of education nor on how to measure outcomes. Much attention is paid to test score results, and in particular, two studies seem to be bellwethers. The National Assessment of Educational Progress (NAEP) is a program that has existed for over 20 years; it involves testing 4th grade, 8th grade, and 12th grade students from many states in mathematics, reading, writing, science, and social studies. The Third International Math and Science Study (TIMSS) was undertaken in 1997. It included math and science assessments of students from several nations at comparable ages and grades, specifically, late elementary (4th grade in the United States), middle school (8th grade), and last year of high school (12th grade).

The results are at best unimpressive. The NAEP results show that roughly one-third of U.S. students fail to meet "basic" levels of competence, about one-third demonstrate basic levels, and about one-third are "proficient" or "advanced" in all of the tested areas. (Usually a very small percentage of students score in the advanced category.) Trends are flat, and racial gaps are narrowing but remain quite wide (NAEP 2000). The TIMSS results generally show that U.S. 4th grade students are among international leaders in science and math, 8th graders are in the middle of the pack, and 12th graders are at or near the bottom (TIMSS 2000). Several analysts believe that the problems with U.S. results are overblown (Bracey 1997; Berliner and Biddle 1996). Yet, when you couple these mediocre test results with continued high levels of high school dropouts, it is no wonder that the public does not believe it is getting good return on its investment.

The educational sector is aware of its shortcomings and perceived mediocrity, and it is undergoing substantial change. Over the past decade, significant changes have occurred in curriculum, instructional techniques, technology, and competitive environment. Virtually all of the states (Iowa being the sole exception) have adopted a standards-based approach to curriculum, in which they have produced a document that states explicitly the skills and knowledge that students are expected to achieve, by grade level, and many have adopted a testing program to measure achievement versus the standards. Additionally, the legacy of the implementation of School-to-Work and Tech Prep programs is that some curricular attention is now paid to career development for all students.

The recent trends in instructional technique include explicit variation to cater to many different learning styles (Gardner 1993) and follow the constructivist paradigm of encouraging individual exploration and learning. The introduction and rapid integration of technology into schools have also altered teaching styles. Finally, the educational sector has experienced a dramatic increase in student and parent choice. Many local districts have adopted policies allowing choice of building and teacher, and about 37 states have implemented charter school policies that allow innovative schools to exist in environments with reduced regulatory constraints. These schools allow parents to opt out of their local school district. Voucher schemes are in their infancy in a few districts and states across the country.

In short, education is a system that is going through significant changes, but it is likely that the challenges it is facing are growing also and at a faster rate, so that education appears to be a "slow-moving" behemoth trying to overcome substantial inertia.

What are the Key Problems that Need to be Addressed?

As the kindergarten through grade 12 (K–12) education system attempts to meet its many challenges, it may be helpful to identify the issues that are most pressing. These issues can be classified into three areas: concerns about overall student achievement, concerns about unequal outcomes across the population, and concerns about an area of education that has experienced drastic (and possibly uncontrolled) cost increases.

Student achievement

Employers and the general public lament what they perceive to be relatively low attainment of basic academic skills. The NAEP evidence, which shows that one-third or more of students do not meet basic levels of competence and that one-third or more of students meet just the basic levels, confirms these perceptions. In science and math, the TIMSS results are equally mediocre. Accountability systems—with their standards-based reforms and "high stakes" testing policies—that are being implemented widely across the nation are a response to this general concern. It seems clear that the public has mandated improved levels of student achievement.

Inequity

The national assessments have shown that there has been slow progress made, at best, in closing the gaps in educational achievement among racial groups. Urban school districts are under particular public scrutiny. Studies suggest that low expectations as well as testing bias may explain some of the gap in black/white test results (Jencks and Phillips 1998), but seemingly incontrovertible evidence suggests that poverty and lack of home-based resources is the major culprit. Poverty and economic disadvantage is disproportionately situated among the minority and urban populations, which explains relatively low achievement in those populations. In recent statistical analyses of test score data in Michigan, poverty as measured by the proportion of students in a building eligible for free or reduced-price lunches was by far the most significant explanator (Hollenbeck and Kracker 1998).

Costs of special education

Public education serves all students without regard to ability or physical condition. Special education (i.e., services to students with physical, mental, or emotional impairments) accounts for a growing share of the student population.

(continued on p. 5)

universalize the academy approach "for all students" in a school or district should be viewed very cautiously, despite legislative calls for universality.

Third, successful academies need to have the numerous necessary program components and commitments in place, because partially implemented programs do not generally produce the desired outcomes. Policies aimed at proliferating academies should only proceed at a pace commensurate with a school district's capacity to recruit and train teachers, raise internal and community resources, and restructure the schools to accommodate the requirements of scheduling and other factors.

Finally, career academies cannot compensate for inadequate education prior to high school. Even where the career academy improved students' academic outcomes, these were relative gains. Overall performance indicators were still low by statewide or national standards.

In sum, because career academies are expensive undertakings that require additional funds and in-kind resources for implementation, the conditions for their success must be considered before they are implemented. However, they may be worth the effort, since there is evidence that the new curriculum, social support, and work experiences offered by the academies can make a very important, positive difference in the lives of many students. The challenge is to create and replicate the enabling circumstances for the right teachers and students, without losing academic rigor.

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Education *(continued from p. 2)*

The burgeoning enrollments as well as accelerating costs of providing services has caused a substantial fiscal burden on education. In many ways, special education can be seen as a success. Over the last half-century, we have gone from the attitude that education should be minimally provided to these students (if at all) to an attitude that special education students should be integrated into school settings and mainstreamed into classrooms. The Individuals with Disabilities Education Act (IDEA; amended in 1997) goes one step further by holding schools accountable for learning outcomes. The costs of this success have been substantial, however, and represent a serious constraint on school districts.

Are there "Silver Bullet" Answers?

As Carpenter (2000) pointed out, there has been no lack of suggestions for reforming education. He reported that in the 10-year period between 1987 and 1997, over 360 "good ideas" to enhance or reform U.S. education were suggested in just one publication, the *Phi Delta Kappan*. He wonders why 10 years of "silver bullets" have produced such limited effect. The answer may be that there are no silver bullets. Consider three major, national initiatives argued by some to be the elusive silver bullet: investment of more resources, establishing national goals and high-profile commitment, and introducing a more competitive environment.

Buoyed by the Tennessee class-size experiment results, many suggest that lowering class sizes may significantly improve educational outcomes (Krueger 1999). In a classical, random-assignment experimental design, the Project Star outcomes showed that reducing class size in the early elementary grades increased achievement for urban students. However, the extent to which a major infusion of resources into education would pay off remains controversial. Hoxby (2000) found that smaller class sizes are not associated with better test score achievement, and Angrist and Lavy (1998) found that professional development may be far more cost-effective than reducing class size.

A second major initiative has been a high-profile effort to set national goals, which are monitored annually, the annual progress toward them being broadly publicized. The National Educational Goals Panel (NEGP) resulted from a group of governors and business people who met in 1989 and decided that the nation needed to establish a few major goals and work toward them. The idea was similar to the national efforts to accomplish a lunar landing, to build an interstate highway system, or to reform the welfare system. The panel established six goals that were to be met by the year 2000 and, if they were met, then the United States would be an international leader in education. The goals were amended to add two additional goals, and annually, the National Educational Goals Panel monitors progress toward the goals. Suffice it to say that they were not met by 2000, and progress has been intermittent.

A third major silver bullet initiative has been to "incentivize" education. In various locations, programs such as pay for performance, charter schools, public school vouchers, and reducing the level of collective bargaining have been tried. To date, incentives have had little influence on achievement (Eberts, Hollenbeck, and Stone 1999).

Conclusion

The evidence seems to suggest that mediocre educational results do not threaten economic performance, and that major initiatives toward reforming education have had limited success. It would seem that in the coming years, we should work toward marginal changes within the existing budget constraints and institutional context.

In this context, research and policy analyses in the economics of education can play an important role in directing educational policymakers toward improved student achievement through better curriculum, instruction, leadership development, and professional development. Areas of inquiry include the following.

- Using econometric techniques to control for intervening factors, what are the impacts of programs and initiatives (such as smaller class size, early childhood interventions, charter schools, or professional development) on learning?
- What interventions seem to work best for students from poor or other disadvantaged backgrounds?
- Because the major outcome of education is learning, which is difficult to place a value on, economists need to assess the cost-effectiveness of educational initiatives. Policymakers and administrators are particularly interested in the cost-effectiveness of special education services, but also there are production choices between technology investments, class size, or teacher training for which we have very little evidence about efficiency.
- How can incentives best be used to improve the system? Are there effective means of implementing incentives in compensation schemes? Are there effective ways of widening market choices for students and parents? Are there incentives that will motivate student effort?
- Do financing mechanisms affect student achievement? Are there ways of more equitably or efficiently financing public education?

In closing, a medical analogy may be instructive. An individual with a relatively straightforward medical problem could go to virtually any physician and receive competent medical attention. The variation among physicians in treatment and in outcome success is probably very minor for many, if not most, conditions; in most cases, a successful outcome is achieved. In education, however, say for a young person entering fourth grade, there is a great deal of variation among districts in the curriculum offered, the instruction, and the outcomes. According to the NAEP, only about one-third of the students achieve high levels of success. What explains the difference?

One difference is that patients are motivated to follow a regimen that will lead to success, i.e., good health; students are not often so motivated. Second, physicians devote considerable resources in making their diagnoses; relatively few districts use annual assessments or beginning-of-the-year tests to drive instruction. In medicine, interventions are standard: desk reference guides, experience, and publicized research are available to guide the physician in offering the most efficacious remedy or treatment; in education, teachers revere their classroom autonomy to teach what and how they wish. Medicine is practiced by licensed physicians who go through four years of rigorous, practical, hands-on instruction beyond the baccalaureate and at least two years of apprenticeship training as interns and residents. They rotate through many different specialties and encounter significant variation in patient needs and conditions. Teachers typically follow a highly theoretical course of study at the undergraduate level that includes a semester of practical application in a single building. It is interesting to note that physicians are probably not influenced greatly by competition or accountability systems.

To the extent that the medical analogy is applicable, future directions in education should be aimed toward improved and more extensive teacher training, more research into and wider dissemination of best practice, improved assessment and documentation of students' achievement levels, and rewards or incentives that improve student motivation.

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